The Importance of Concentration Risk in Terms of Liquidity Risk Management

Likidite Riski Yönetimi Açısından Yoğunlaşma Riskinin Önemi

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ABSTRACT

There is an extensive literature on banking's liquidity transformation and creation capacity. Also, there have been studies on liquidity risk management in banks recently. However, in order to assess liquidity, more emphasis is needed on the nature of liquid assets in banks' balance sheets and their share in the balance sheet. For this reason, it is useful to look closely at the course of liquid assets in banks' balance sheets and the nature of these liquid assets. The concentration risk which is of great importance for almost every type of risk, is also critical for liquidity risk and liquid assets. Therefore, it is thought that a concentration-oriented view, independent of the nature of liquid assets, is essential for assessing liquidity risk. Overdependence even on assets that are assumed to be risk-free or very liquid can cause serious vulnerabilities. Additionally, it would be beneficial to monitor level of these liquid assets system wide. Relying mostly on holding liquid assets representing a claim from only one counterparty for liquidity management creates concentration risk. Also, prudential authorities should be aware of concentration risk dimension of liquidity management at the individual bank level especially for contingency planning.

Keywords: Liquidity, Concentration, Risks, Banks, Financial Stability

ÖZ

Bankacılığın likidite dönüştürme ve yaratma kapasitesi hakkında geniş bir literatür bulunmaktadır. Ayrıca son zamanlarda bankalarda özellikle likidite riski yönetimi hakkında yoğun çalışmalar da yapılmıştır. Ancak likiditeyi daha sağlıklı değerlendirmek için bankaların bilançolarındaki likit varlıkların niteliğine ve bilançodaki paylarına daha fazla vurgu yapılması gerekmektedir. Bu nedenle bankaların bilançolarındaki likit varlıkların seyrine ve bu likit varlıkların niteliğine yakından bakmak son derece yararlıdır. Hemen hemen her türlü risk için büyük önem taşıyan yoğunlaşma riski, likidite riski ve likit varlıklar için de kritik bir öneme sahiptir. Bu nedenle likit varlıkların niteliğinden bağımsız, yoğunlaşma odaklı bir bakış açısının likidite riskini değerlendirmek için elzem olduğu düşünülmektedir. Risksiz veya çok likit olduğu varsayılan varlıklara bile aşırı bağımlılık ciddi kırılganlıklara neden olabilir. İlave olarak, bu likit varlıkların seviyesinin sistem genelinde izlenmesi faydalı olacaktır. Likidite yönetimde, muhtemel ani taleplere karşı yalnızca belirli likit varlıkları tutmaya odaklanmak yoğunlaşma riski yaratabilir. Nitekim Mart 2023'te ABD'de iflas eden Silicon Valley Bank bunun en somut örneğidir. Ayrıca yasal otoriteler, özellikle acil durum planlaması için tekil banka düzeyinde de likidite yönetiminin yoğunlaşma riski boyutunu yakından takip etmelidir.

Anahtar Kelimeler: Likidite, Yoğunlaşma, Riskler, Bankalar, Finansal İstikrar

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1. Introduction

Liquidity generally refers to the ability of an asset to be converted into cash. However, for financial institutions, the mere ability to convert an asset into cash may not be a sufficient indicator. The acceleration in fund movements, especially with digitalization, has made the concentration risk important for liquidity. Concentration often appears in the context of credit risk and inequality. Bank bankruptcies witnessed in the USA and Switzerland at the beginning of 2023 also drew extra attention to the concentration in terms of liquidity risk.

The importance of liquidity for banks and its role in financial crises is a well-known issue. However, especially in the banking, the framework for measuring, managing and regulating liquidity is an ever-evolving and argumentative field (Bai et al., 2018, p. 51-54). There may be a general consensus on what liquidity is, but a similar consensus on the content and scope of liquidity regulations seems difficult. Liquid assets are generally considered to be cash and cash equivalents. Cash equivalent assets are mainly government bonds, which are considered risk-free, and very short-term financial investments (Repo, Depo, Swaps…). In fact, it is clear that the nature of liquid assets other than cash is as important as their share in the portfolio or assets. Because some cash-like investments that are considered risk-free or very low-risk may face the risk of interest, credit or conversion to cash due to excessive concentration in the portfolio or assets. This may require considering concentration risk in terms of liquidity.

In this study, firstly, the relevant literature on the formation, source and management of liquidity risk in banking was examined. The capacity of banking to transform and create liquidity was mentioned. Particular attention was paid to the concentration discussions triggered by the bank failures that occurred in March 2023. Subsequently, the liquidity risk management principles developed by the Basel Committee on Banking Supervision over the years were evaluated. Then, the possible effects of the concentration issue on liquidity risk are shown by the historical data of the Silocon Volley Bank, US and Turkish Banking Sectors. As a result, it is emphasized why concentration risk is so important in terms of liquidity.

2. Literature Review

Banks are very significant institutions with their capacity to create liquidity in an economy. In a sense, they have a special mechanism. *"Mechanisms that commit the lender to collecting the loans create liquidity. A bank is structured to be such a mechanism"* (Diamond and Rajan, 2001, p. 287-327) Liquidity creation and risk transformation functions are considered the most important financial intermediary roles of banks. Banks basically convert long-term and illiquid assets and off-balance sheet non-cash liabilities into liquidity in their balance sheets through liquid liabilities. Although the risk transformation function of banks has been analyzed more, both functions of banking may intersect when illiquid assets are financed by relatively liquid liabilities. However, this intersection may not always occur together and at the same rate. For this reason, measuring and managing liquidity is always essential for banks (Berger and Bouwman, 2009, p. 3779-3782). The liquidity creation and risk transformation capacity of banks can also be expressed as *"Traditional banks create money-like claims by holding illiquid fixed-income assets to maturity, and they rely on deposit insurance and costly equity capital to support this strategy*" (Hanson et al., 2015, p. 449-469). Although high liquidity is often seen as a positive criterion for an institution, it is argued that operating with high liquidity may paradoxically restrict financial institutions' risk taking and business models (Myers and Rajan, 1998, p. 733-771).

It is known that the liquidity in banks' balance sheets and the liquidity conversion capacities of banks are the fundamental issues of banking and banking regulations. In this context, it is stated that the credit risks undertaken by banks are one of the most important constraints on the liquidity conversion capacity of banks (Deep and Schaefer, 2004, p. 17-35). It is also claimed that public regulations and treasury debt securities are important tools for the liquidity needs and management of markets, especially in banks and distressed times (Holmström and Tirole, 1998, p. 32-39). There is an alternative cost of holding money or near-money assets (Government Bonds…) as liquidity. The most important factors that determine this cost and demand are interest rates and supply and demand conditions of near-money assets. Therefore, liquidity premium is one of the basic elements of liquidity in balance sheets (Nagel, 2016, p. 1927-1971). It is even mentioned that national cultures have an impact on the liquidity creation capacity of banks (Boubakri et al., 2023, p. 1-5).

Although providing liquidity by issuing reliable liabilities is one of the most important economic functions of financial intermediation, market-based financial intermediation has also developed recently alongside traditional banking. However, it is also recommended to take into account business model differences, where balance sheet-targeted capital and liquidity regulations may not be sufficient for liquidity creation in such an environment (Luck and Schempp, 2023, p. 1-2, 9-10). Also, rather than regulating liquidity risk on the basis of individual institutions, general and clear limiting principles (tradable licensing of short-term funding) are also recommended at the level of the system as a whole (Milne, 2013, p. 23-26). Financial intermediaries have a very important function against liquidity shocks in an economy. It may be beneficial not to leave the liquidity capacities of financial intermediaries solely to the market but to regulate them even partially. In this sense, some limitations regarding short-term liquid assets can be discussed. Regulations can be seen as an important topic in the context of prudence and liquidity. *"A simple intervention - liquidity requirement - can implement the constrained efficient allocation"* (Farhi et al., 2009, p. 973-988). It is clear that liquidity measures, as a regulatory tool, are very important in terms of their impact on the soundness and capital strength of banking. In fact, it is stated that liquidity measures support the capital structures of banks and are as significant as capital requirement regulations. It is recommended that factors such as market share, product diversity and competition of financial institutions be taken into consideration when evaluating the liquidity positions and adequacy of financial institutions. In a sense, concentration issues are indirectly emphasized in terms of liquidity (Patel et al., 2022, p. 1-19).

Even though there is a general consensus on the necessity of liquidity regulations, especially after the announcement of Basel III, there are discussions regarding the method in the literature. Generally, *"an optimal regulatory design may combine price and quantity-based instruments and the emphasis on each of them will depend on what is the dominant dimension of heterogeneity across banks (or variation over time)"* (Perotti and Suarez, 2011, p. 1-33). After the 2007-2008 global financial crisis, new liquidity regulations for banks such as Basel III have also caused some discussions. It is generally mentioned that liquidity-focused studies are carried out on the basis of deposits (especially demand deposits). However, it is stated that funding other than deposits is also important in terms of liquidity. For this reason, it is also claimed that liquidity regulations that can be adjusted according to current conditions, taking into account liability concentration, are significant (Dubois and Lambertini, 2017, p. 1-41).

In general, it is clear how important the concentration of risks and financial intermediaries is for the level and impact of the systemic risk in an economy (Coimbra et al., 2021, p. 1-35). In an analysis based on data from OECD countries before the 2008 great financial crisis, it was understood that

banks' tendency to hold liquid assets without specific liquidity regulation was determined by country and bank-specific characteristics. Factors such as the country's public disclosure requirements, the level of concentration in the banking sector, and the banks' business model, profitability, asset size, and deposit level determine the level of liquid assets of banks. Liquidity regulations indicate a non-linear relationship between banks' size and liquid assets. It is found that larger banks tend to hold more liquid assets. While large banks are of course important from a systemic perspective, the role of relatively smaller financial intermediaries in terms of systemic risk should also be taken into consideration (Bonner et al., 2013, p. 1-19).

Some studies show that macroprudential measures at the systemic level, rather than individual bank-focused liquidity regulations, may be more beneficial in the context of financial stability. It is argued that a macroprudential rather than micro prudential perspective may result in more efficient distribution of liquidity among banks (Aldasoro et al., 2019). In general, capital requirements issued by Basel Committee focus on problems arising from bank assets, while newer liquidity requirements target liquidity difficulties arising from liabilities. On the other hand, systemic risks due to the contagion effect in the financial system may arise from these two balance sheet channels at different rates. It is claimed that adjusting liquidity regulations according to the systemic importance of banks can help solving problems such as liquidity shortage, contagion effect and amplification in the financial system (Aldasoro and Faia, 2016, p. 1-16).

The bankruptcy of Silicon Valley Bank (SVB) in the USA at the beginning of 2023 has brought the concentration risk to the top of the agenda in the financial world. *"The insolvency of Silicon Valley Bank is a powerful reminder of the risks faced by banks with 'similar investors'. The bank's deposits were large, uninsured and mostly from one industry, exposing it to correlated withdrawals."* Therefore, it is argued that the current bank supervision approach focuses on bank assets and equity. The importance of including the distribution and analysis of banks› liabilities other than equity capital within the scope of supervisions and stress tests more and more effectively is emphasized. It is significant to consider concentration risk in terms of banks› uninsured liabilities. Liquidity risk management and regulations need to take these issues into consideration (Georg and Steffen, 2023).

The bankruptcy of SVB in the USA shows the importance of banks being subject to similar regulations regardless of their size. All banks, not just large-scale ones, must be subject to certain kind of liquidity rules. Because the details and structures of all banks' assets and liabilities are significant for managing the liquidity risk they face. Effective balance sheet management is necessary as well as adequate supervision and control in the management of liquidity risk (Baloğlu et al., 2023, p. 67-89). It is also stated in the literature that studies on liquidity risk mainly focus on factors that have an impact on liquidity risk. It was found that the variables *"affecting the liquidity risk of the Turkish Banking Sector are the return on asset, deposits/total liability ratio, interest income/interest expense ratio, private bond issuance, inflation rate, unemployment rate, United States Dollar exchange rate and Gross Domestic Product"* (Akkaya and Azimli, 2018, p. 35-48). In another study on the banks of Türkiye, it was found that asset size, return on equity, capital, deposit growth, provision for loan losses, economic growth and inflation are important factors for the liquidity risk of banks (Işık and Belke; 2017, p. 113-126). A more recent study on the Turkish Banks found that return on equity, total assets, deposit/total liabilities ratio, FX position, inflation and economic growth positively affected the liquidity structure of banks in Türkiye. On the other hand, it was found that the credit/total assets ratio, financial asset ratio, fixed asset ratio, central bank overnight interest rate and exchange rates increase bank liquidity risk (Güzel, 2023, p. 109-135).

3. Liquidity Risk Management Principles in Banking

The management of liquidity risk in banking can be considered as old as the history of banking practice. However, The Basel Committee on Banking Supervision (BCBS) published the first liquidity document in the form of "Framework for Measuring and Managing Liquidity" in 1992. "*This paper brings together practice and techniques currently employed by major international banks in a single analytical framework. While no bank may follow this framework precisely, it is a model which is believed to be an example of current sound management practice and which could provide useful guidance to all banks."* This document discusses the measurement and management of liquidity risk with a three-dimensional approach: "measuring and managing net funding requirements, managing market access and contingency planning" (BCBS, 1992). In 2000, BCBS published a new liquidity risk document called "Sound Practices for Managing Liquidity in Banking Organizations", which includes 14 concrete principles. These 14 principles attempted to further concretize liquidity risk management within the framework of the previous three-dimensional approach. The general regulatory titles of these 14 principles are: "developing a structure for managing liquidity, measuring and monitoring net funding requirements, managing market access, contingency planning, foreign currency liquidity management, internal controls for liquidity risk management, role of public disclosure in improving liquidity, role of supervisors" (BCBS, 2000).

After the 2007-2008 great financial crisis, the issue of liquidity gained more importance and became a subject of discussion. BCBS also contributed in that process with its new document titled "Principles for Sound Liquidity Risk Management and Supervision" published in 2008. This new document consists of a total of 17 principles under five titles. These titles are "fundamental principle for the management and supervision of liquidity risk, governance of liquidity risk management, measurement and management of liquidity risk, public disclosure, the role of supervisors" (BCBS, 2008). BCBS reviewed these liquidity principles in 2019 and confirmed its adequacy. This review included all significant developments in liquidity risk since 2008. All member countries of the Committee adopted these principles as legal regulation, supervision guide or practice. The Committee accepts "Liquidity Coverage Ratio" and "Net Stable Funding Ratio", which are significant elements of Basel III, as a very important complementary part of these principles. It was emphasized that developing technology, increasing digitalization and cyber opportunities brought different issues to the agenda in liquidity risk management. The committee emphasizes the importance of banks and market participants managing liquidity risk prudently. In addition, the committee expects banks' risk management and supervisory institutions to approach the implementation of these principles consistently and rigorously (BCBS, 2019).

After the bank failures in 2023, BCBS undertakes a study to assess the implications of banking turmoil for regulation and supervision of banks. Although it is emphasized that the study does not indicate any plan for revisions in existing Basel Framework, there appear to be certain issues need to be followed-up in order to implement BCBS standard in a full and consistent manner (BCBS, 2023).

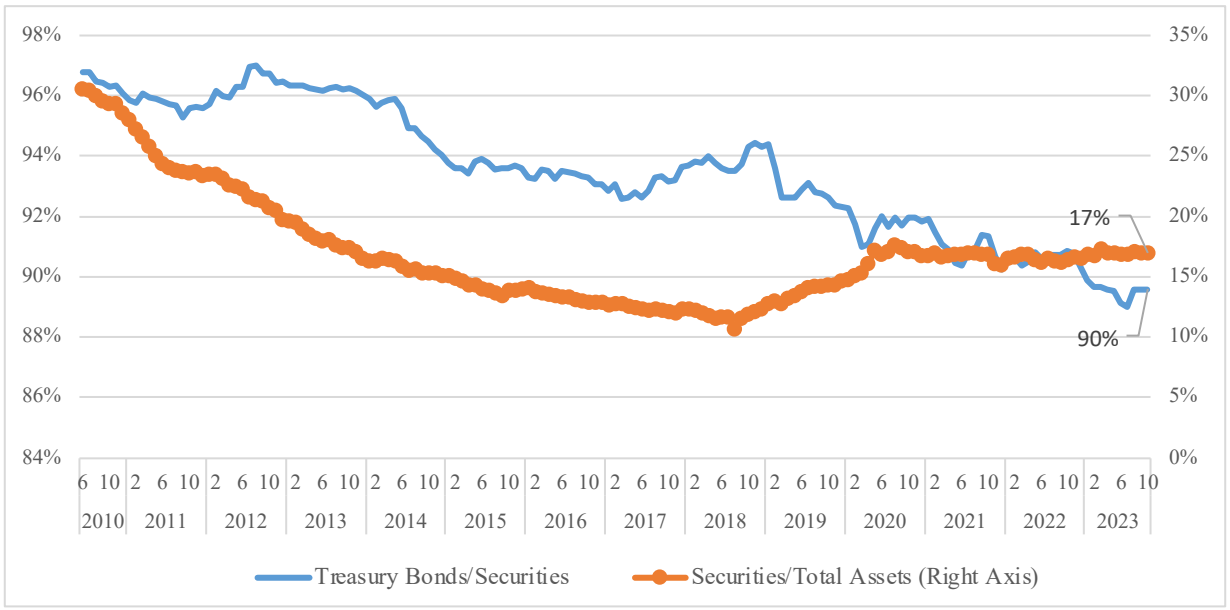
4. Liquidity and Concentration

One of the basic regulatory and supervision tools used to prevent and solve problems in the banking system is to increase the level of liquid assets of banks against their short-term liquidity liabilities. The level of liquid reserves is a vital assurance element against banking crises. The most critical point in terms of liquidity ratios is cash and equivalent short-term assets that will be considered liquid

assets. It is important to monitor the share of banks' current liquid assets in total assets as a liquidity management instrument and to use it to take necessary regulatory and supervisory measures (Tiryaki, 2012, p. 181-182).

As financial assets, securities, especially the ones issued by sovereigns, are considered one of the most important liquid assets. In particular, government debt securities are generally accepted as theoretically and legally risk-free assets. For this reason, treasury bonds are always seen and used as an important tool in the management of liquidity risk. However, the weight of each asset or liability on the balance sheet of a financial institution or other economic unit should be closely assessed. Because accepting an asset as risk-free theoretically or legally may not always produce the same result in practice. Regardless of the intrinsic nature of the asset, having an excessive weight in a portfolio can trigger some serious risks. Therefore, it is useful to focus on the issue of concentration, regardless of the characteristics of the assets of economic units. For instance, the share of securities in assets and the share of treasury bonds in securities in the Turkish Banking System are shown in **Graph 1**.

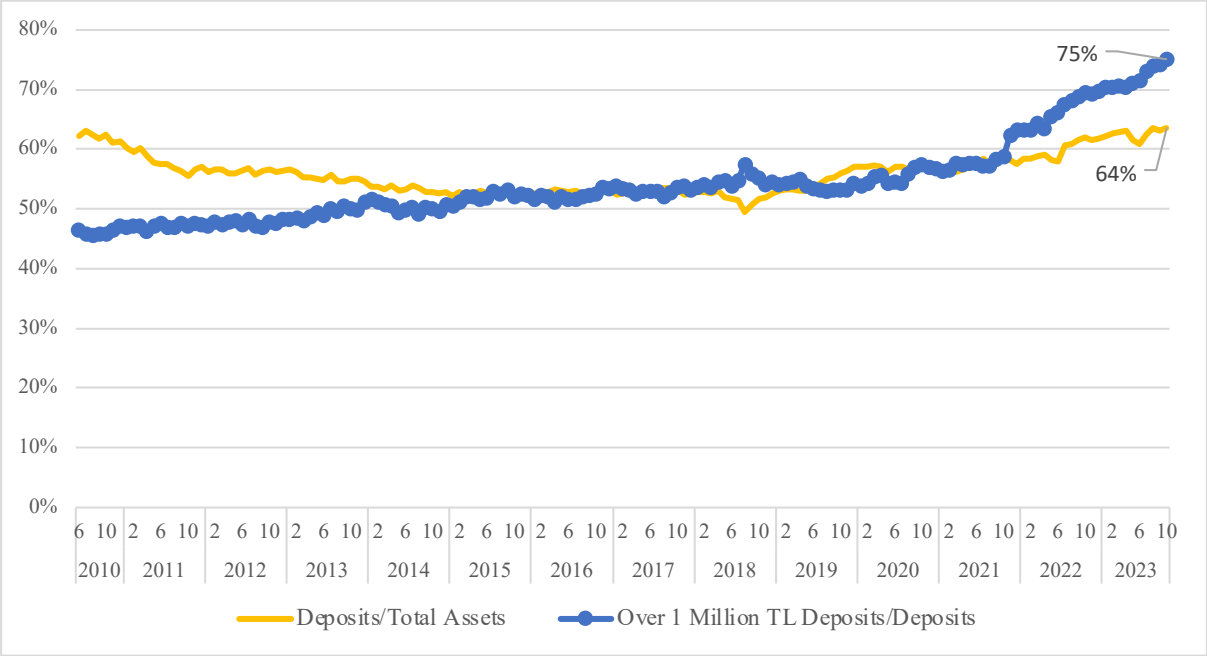
Graph 1: The Data of Turkish Banks' Securities



Source: (BDDK, 2023)

The majority of the most liquid part of the bank assets in Türkiye is composed of government securities and placements in the Central Bank. The Central Bank in Türkiye has recently made transactions in FX swap markets in order to ensure exchange rate stability and has tried to strengthen its reserves in this way. It is noted that the Central Bank uses FX swap transactions as a new monetary policy tool to stabilize foreign exchange markets (Özgün Acar, 2022, p. 57-72). Apart from the asset side of the Turkish Banks, especially in the liquid assets, a clear pattern on the liability side (Tiryaki, 2015, p. 31-54) is also immediately noticeable in **Graph 2**.

Graph 2: The Data of Turkish Banks' Deposits



Source: (BDDK, 2023)

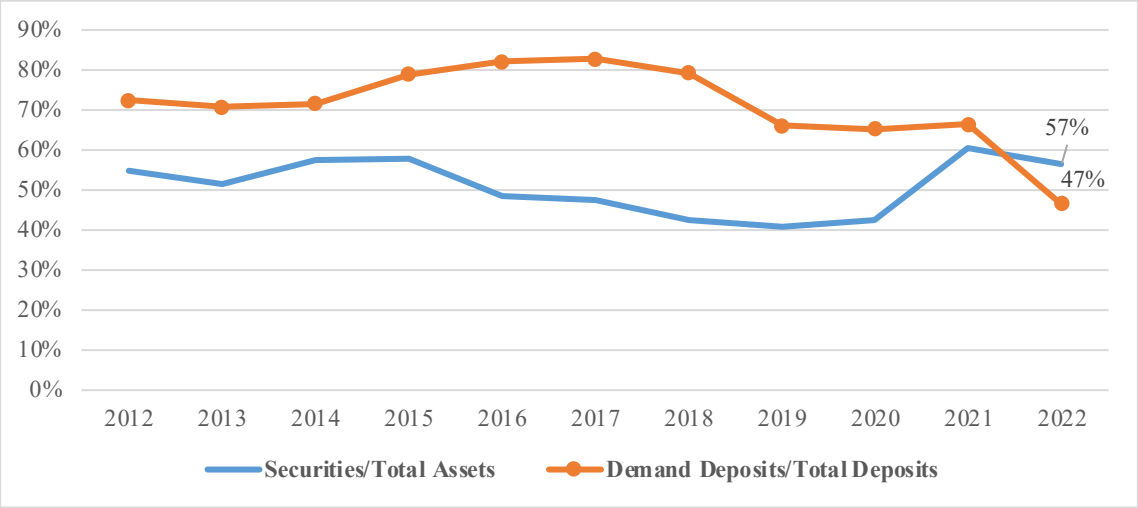
On March 10, 2023, the SVB bankruptcy occurred, one of the largest bank failures in US history. SVB is a bank founded in California in 1983 to serve technology companies. Over the years, it has focused especially on serving newly established and high-potential technology companies. SVB, which was growing and making profits especially in the recent period, showed signs of deterioration after the FED started to increase interest rates as of March 2022. The bank's customers are generally technology companies with high deposit amounts. The bank invested these deposits, some of which were demand deposits, mainly in long-term US debt securities Therefore, SVB undertook a high maturity and price risk because of these funding and investment strategies.

"SVB's investment strategy and portfolio composition were key factors in its downfall. With the surge in deposits during the pandemic, SVB faced the challenge of managing this vast pool of funds. Opting for a conservative approach, the bank invested heavily in long-term U.S. Treasury bonds and government-backed mortgage securities. These securities are generally considered safe, low-risk investments" (Corbet and Larkin, 2023, p. 3),

"The bank's assets' value declines every time the US Federal Reserve raises interest rates. As investors fled from the stock market and shifted towards investing in government bonds due to the higher returns and lower risks, start-up companies faced difficulties. They relied on their existing bank balances to maintain their continuity and with withdrawals increasing and cash flow decreasing at Silicon Valley Bank, the bank was forced to sell government bonds at a lower price than their actual value to provide liquidity to its customers, most of whom were start-up owners. This resulted in Silicon Valley Bank realizing losses that were previously unrealized. Depositors scrambled to withdraw their money, while venture capital companies urged their funded start-ups to expedite their withdrawal as well. This panic caused a weakness for the bank" (Al-Sowaidi and Faour, 2023, p. 39-43),

This situation led to the bankruptcy of SVB. In fact, it is possible to see the course of the current investment and funding strategy from some of SVB's financial information. **Graph 3** shows the ratios of securities investments and demand deposits in its balance sheet since 2012, which were the most important factors in SVB's bankruptcy. Although there is a decrease in rates after the FED's interest rate increase in 2022, the rates still indicate a high concentration.

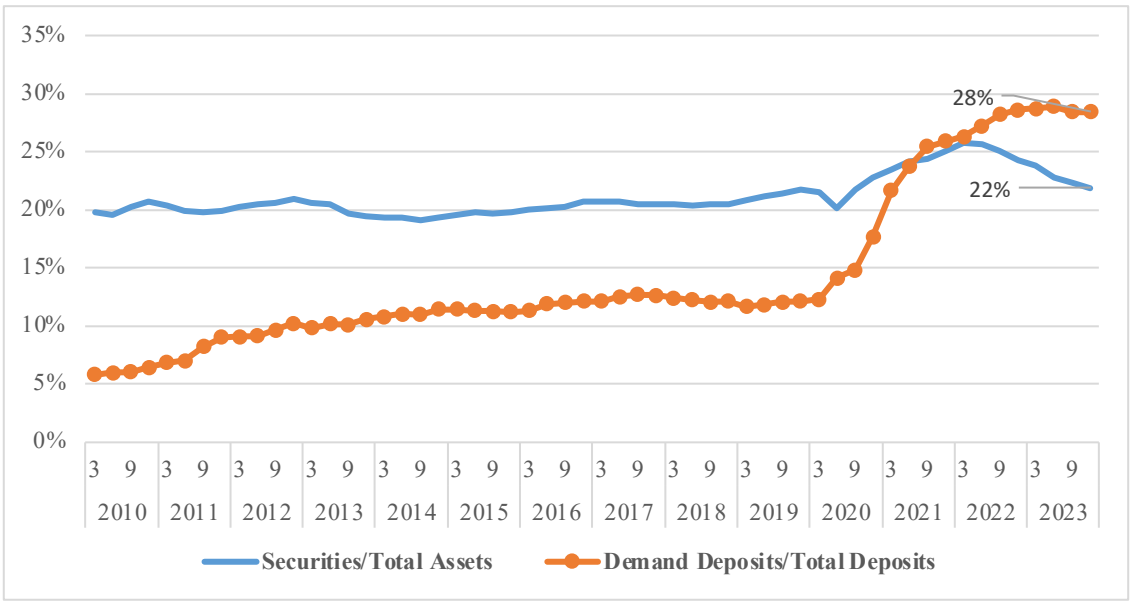
Graph 3: The Financial Ratios of SVB



Source: (SVB, 2024)

How highly concentrated SVB operates can be seen immediately from the securities and demand deposit rates of US commercial banks for the same period in **Graph 4**. SVB's securities investment and demand deposit rates, concentrations in this area, are nearly twice as high as relative to those in the US commercial banking sector.

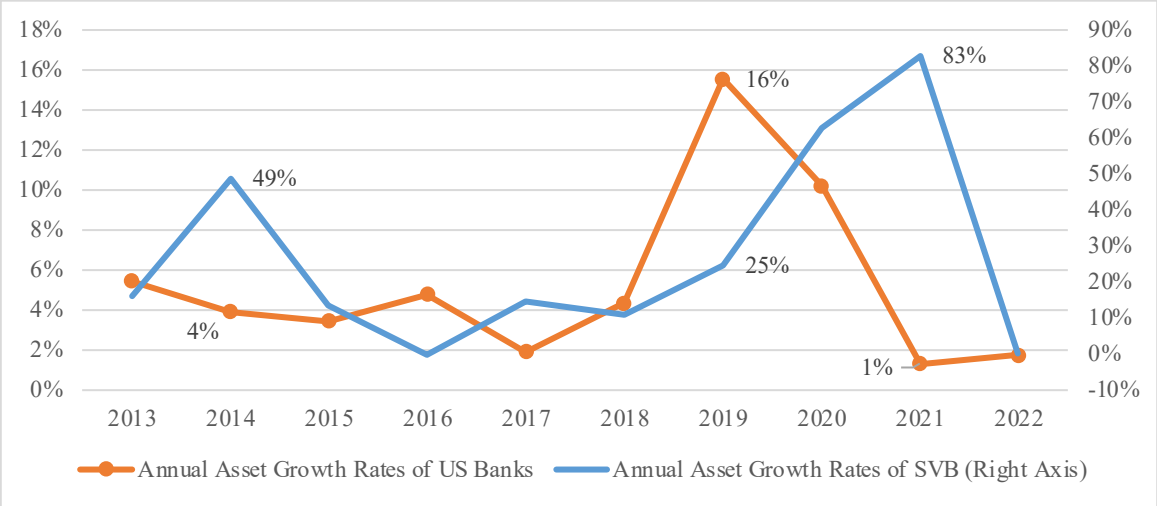
Graph 4: The Financial Ratios of US Commercial Banks



Source: (FRED, 2024)

Additionally, **Graph 5** shows how important the growth of financial institutions is for both concentration risk and other risks.

Graph 5: The Annual Growth Rates of US Banks and SVB's Balance Sheet



Source: (SVB and FRED, 2024)

While SVB's annual growth average between 2013 and 2022 was 27%, the growth of US commercial banks in the same period remained at 5%. A similar trend is also observed in the standard deviations of the growth average of US commercial banks and SVB. Therefore, the combination of rapid and excessive growth and a high concentration of assets and liabilities created an extremely sensitive financially situation in terms of liquidity. SVB's bankruptcy process was a concrete and historical example in terms of risk management, portfolio diversification and concentration risk in banks (Al-Sowaidi and Faour, 2023, p. 44), (Corbet and Larkin, 2023, p. 7-8).

What stands out in all these graphs is simply the matter of concentration. Concentration, whether on the asset or liability side, can be important for all types of risk. It may be one of the most fundamental issues that concerns and can affect all types of risks, financial or non-financial. There are few factors as key to human and economic life as the risk of concentration. From portfolio diversification in the investment theory to individual loan limits of banks, from income and wealth distribution to the big data, there are few areas where concentration is not relevant and important. In this context, it can be easily seen from the above graphs how notable the concentration is in terms of liquidity risk. Likewise, one of the most important elements of any effective financial risk management and acceptable investment policy (philosophy) is portfolio diversification and concentration: *"Reasonable portfolio diversification should be pursued to ensure that the bank does not have excessive concentration of individual securities, security types or security characteristics"* (Santomero, 1997, p. 105)

As mentioned in the literature, analyses of liquidity regulations in banking compared to capital are limited. *"In particular, the models the analysis is based on are quite simple and capture only a small part of the market failures that have been identified in the literature on liquidity provision. At a more basic level, there is no clear analysis of whether liquidity should correspond to short term real assets or to monetary instruments. Distorting the allocation of real assets through regulation may be socially costly"* (Allen, 2014, p. 24). Therefore, it seems that the issues of liquidity, liquidity transformation and liquid assets and how to regulate all these elements in the financial system will continue to be discussed. For instance, *"the existing safety net was insufficient at sustaining a synergy between deposit-taking and commitment lending. Policymakers need to design other -or alternative- mechanisms to ensure an uninterrupted supply of credit to creditworthy borrower"* (Acharya and

Mora, 2015, p. 41). Although such discussions are made in the financial literature, BCBS (2019) states in its comprehensive evaluation that the current liquidity risk framework for banks is sufficient in principle. Meanwhile it is clear how important concentration risk is in terms of liquidity and liquidity risk management.

5. Conclusions

Idea behind banks holding liquid assets against their liabilities is to ensure that they survive an adverse period, either bank specific or marketwise, without defaulting on their customers' withdrawals until central bank or other related authorities step in to take necessary actions. That's why almost all bank supervisors around the world require banks to have certain amounts of liquid assets and/or meet certain liquidity ratios. These requirements assume that liquid assets, which mostly include government securities or placements with central banks, complying with the conditions depicted in regulations can be successfully converted into cash to meet the customers' demand in stress periods. Then, the more is the better for banks in terms of liquidity adequacy, or is it so? Although market disruptions and valuation fluctuations are usually considered in assessing the adequacy of liquid assets' ability to be converted into cash, concentration of liquid assets in the form of government securities and central bank placements should be also taken into account especially from the systemic point of view.

The most important risk factor in human life may be concentration. It is clear that the economy and banking are no different from this. In fact, concentration is one of the most important and strategic concepts of bank supervision (Tiryaki, 2024, p. 95-105). Because concentration indicates a risk, regardless of the intrinsic nature of assets. This refers a weight, which means excessive dependence on something. No matter how good and solid the quality of an asset is, excessive dependence on that eventually involves serious vulnerability. In fact, this is the reality that concentration risk fully reflects. This situation may be more dramatic in terms of liquidity risk.

Liquidity transformation ability and providing liquidity are one of the most fundamental qualities and advantages of banks. These features are directly linked to the liquid assets on banks' balance sheets. Therefore, even sole the distribution of liquid assets in banks' assets is very important, regardless of how qualified they are. For instance, it is noteworthy that most of the liquid assets on bank balance sheets are in the form of investments in public entities. The banks need to manage the concentration issue prudently in every aspect in terms of liquidity risk management.

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